

TITLE

SAND ANCHORS

BACKGROUND OF THE INVENTION

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This invention relates to sand anchors and in particular to sand anchors for recreational watercraft, off road vehicles and light aircraft.

DESCRIPTION OF PRIOR ART

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There is a need for an efficient sand anchor to safely and securely anchor a vessel at a beach or the like.

Most recreational watercraft from small dinghies through to pleasure craft of up to say 15 metres in length carry one or more sea anchors designed to engage a sea bed.

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In sheltered waters it is possible to anchor such craft adjacent the water's edge with a stern anchor secured to the sea bed and a bow, anchor embedded up the beach in the sand.

All sea anchors require for their effectiveness a long anchor line and a length of heavy chain connected directly to the anchor to maintain the shank of the anchor against or as close to the sea bed as possible to ensure effective engagement by the anchor flukes with the sandy sea bed.

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For recreational boaters, it is quite inconvenient and often hazardous to step over the side of vessel carrying a heavy and cumbersome anchor and associated chain.

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While the bow anchor is positioned on the beach some distance from the water's edge and thus usually at an elevated position relative to the water level, the angle of tension applied to the anchor line is generally very low.

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Even although the tension applied to the anchor is low, typical

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anchors such as Danforth, Admiralty pattern or the like have a quite ineffective holding power in loose sand.

Notwithstanding that the horizontal tension applied in an anchor rope, even by large pleasure craft due to wave or wash action is only of
5 the order of about 5kg, the constant tugging can drag even a very heavy anchor over the surface of loose sand.

United States Patent No. 4756128 describes a beach anchor having a flat strip of metal with downturned right angle bends at both ends. The small downturned front portion and the larger tapered
10 downturned rear portion cooperate when embedded to provide a resistance to tension in an anchor line. A pointed spike with a handle at its upper end assists in insertion and withdrawal of the anchor.

United States Patent Nos. 2870884 and 4679369 both describe multiple stake anchoring systems wherein parallel stakes are driven
15 through apertures in one or more frames to anchor the frame to the earth. United States Patent 5243795 describes an anchoring rod to which is attached anchor body having inclined apertures to guide further anchoring rods driven into the earth at differing predetermined angles.

In United States Patent No. 4315387 there is disclosed a ground
20 anchor stake having a pair of spaced parallel ground penetrating tines and ground penetrating arcuate tines pivotally connected thereto.

Each of United States Patents 4936194, 5460112, 4800843 and 4960064 all describe elongate ground penetrating stakes for anchoring or tethering purposes.

25 United States Patent No. 5431123 describes a boat anchor having a body which is secured to the ground surface by a rod driven through an aperture in the body.

United States Patent No. 4732105 describes a boat anchor having a plurality of flukes and pivotal bail to release the anchor when fouled on a
30 sea bed.

There is therefor a need for a compact, lightweight sand anchor

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which is easily and safely stowed and handled, is easily inserted and withdrawn from sand soil without the need for special tools and otherwise provides a secure beachside anchoring for watercraft in a wide range of sizes.

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SUMMARY OF THE INVENTION

Accordingly it is an object of the present invention to provide a compact sand anchor which is easy to insert and withdraw from sand soil and otherwise is capable of withstanding substantial tension in an anchor rope.

According to the present invention there is provided a sand anchor, said anchor comprising:-

two or more substantially parallel tines mounted in spaced relationship at respective first ends on a mounting member, said parallel tines each having a second free tapered end;

attachment means for securing an anchor line thereto; and,

a compression member adjacent said first ends of said tines and lying in a plane parallel to said tines.

The anchor may comprise from three to five tines.

Preferably the anchor comprises three tines.

Suitably the compression member comprises a planar member extending transversely over upper forwardly facing regions of said tines.

If required the compression member may comprise the mounting member.

Alternatively the compression member may be formed integrally with said mounting member.

The anchor may include a stabilising member extending forwardly of said mounting member.

Suitably, the stabilising member extends substantially perpendicular to the plane of the tines.

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If required the stabilising member may be pivotally attached to said mounting member for movement between a retracted position adjacent said tines and an extended position substantially perpendicular to the plane of said tines.

5 Preferably the stabilising member includes attachment means.

The stabilising member may comprise a plate-like member extending transversely of said mounting member.

Alternatively, the stabilising member may comprise an arcuate member extending transversely of said mounting member.

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BRIEF DESCRIPTION OF THE DRAWINGS

In order that the invention may be more fully understood and put into practical effect, preferred embodiments are described with reference to the accompanying drawings in which:-

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FIG 1 shows a perspective view of one embodiment of the invention.

FIG 2 shows an inverted rear view of the embodiment of FIG 1.

FIG 3 shows a front elevation of the embodiment of FIG 1.

20 FIG 4 shows a perspective view of an alternative embodiment in a retracted position.

FIG 5 shows the embodiment of FIG 5 in an extended position.

FIG 6 shows a perspective view of the embodiment of FIG 4 from below.

25 FIG 7 shows a schematic side elevation of the embodiment of FIG 4 illustrating a possible mode of operation.

DESCRIPTION OF SPECIFIC EMBODIMENTS

30 In FIGS 1 to 3 there is shown one embodiment of a sand anchor comprising three parallel rod-like tines 1, tapered at their lower ends 2 and

supported in spaced relationship by an upper mounting member 3.

Extending across the front of the tines is an upright face which functions in use as a compression member 4.

5 The free ends 5 of the compression member 4 extend rearwardly below the mounting member 3 and pivotally support a stabilising member 6 in the form of an arcuate loop. The projecting ends 3a of mounting member 3 serve as stops to prevent the stabilising member 6 from pivoting beyond a plane substantially perpendicular to the plane of the tines when the stabilising member 6 is extended as shown in FIG 1.

10 Stabilising member 6 also provides a means for attachment of an anchor rope (not shown) by means of a shackle or the like (not shown).

In the embodiment illustrated, the mounting member 3 and compression member 4 are conveniently formed as an integral body from a length of angle section aluminium or stainless steel.

15 As shown in FIG 2, the tines 1 are welded to the inner face of compression member 4 and the outer tines 1a, 1b are also welded to the free end returns 5 of compression member 4.

Typically, the tines 1 are comprised of 10mm rod and may be of a length of from 200mm to 750mm.

20 In practice it has been found for sand anchoring an optimum tine length of about 250mm to 300mm provides adequate anchoring power combined with ease of stowage, and ease of insertion and retraction.

Below about 200mm in length the sand anchor does not provide secure anchoring power and over about 300mm, while anchoring power is increased, this exceeds the anchoring required for shore anchoring of vessels, adds to inconvenience in stowage and handling as well as increased difficulty in insertion and withdrawal from sandy soil.

FIGS 4-6 show an alternative embodiment of the invention and like reference numeral are employed for like features.

30 The main difference between the embodiment of FIGS 1-3 and that of FIGS 4-6 is the configuration of the stabilising member 6.

In FIGS 5-6 the stabilising member 6 comprises a plate-like body 7 extending transversely over the front of mounting member 3.

The free ends 8 of body 7 are downturned and extend rearwardly below free ends 3a of mounting member 3 to permit pivotal connection by
 5 rivets 9 or the like to the free ends 5 of compression member 4.

Like the embodiment of FIGS 1-3, the stabilising member 6 of FIGS 4-6 is constrained to pivot from a retracted position as shown in FIG 4 to an extended position in FIG 5 wherein the plate-like body 7 extends substantially perpendicular to the plane of the tines 1.

10 An aperture 10 is provided in stabilising member 6 to permit attachment of an anchor rope by means of a shackle or the like (not shown).

While not wishing to be bound by any particular theory underlying the operation of the anchor, the mode of operation of the anchor as
 15 presently understood will now be described with reference to FIG 7.

In use, the sand anchors according to the invention are placed at a distance from the water's edge and thus by nature, the tension applied in the anchor rope is at and parallel to the ground surface in the region of the anchor.

20 After selecting a region of sandy beach within which to anchor the vessel, the top layer of very loose sand, typically about 25mm in depth is swept aside and the anchor may be inserted into the sand by hand or foot pressure applied to the top of mounting plate 3.

The anchor is inserted to the fullest extent with the tines 1 and
 25 compression member 4 embedded in the sand and the plate-like body 7 lying against the surface 11 of the sand, the free ends 8 of member 7 also being embedded in the sand.

When tension is applied in the direction shown by arrow A to shackle 12 from an anchor line (not shown) by tugging from a vessel, the
 30 tines 1 initially undergo a degree of bending about a fulcrum point B about two thirds of the way along the length of the tines. This induces regions of

compression 13 and 14 shown by shaded areas respectively at the lower rear of tines 1 and the upper front of tines 1.

At the same time, compression member 4 induces a region of compression 15 shown in phantom.

5 As tines 1 undergo a limited degree of bending plate-like body 7 also induces a downwardly directed region of compression shown in phantom at 16. This compression region 16 overlaps compression region 15 and the upper part of compression region 14 thus reinforcing the sand mass against a rotational force applied to the anchor.

10 As the periodic tugging tension is released, the resilience of tines 1 returns the anchor to a rest or static position.

It is believed that the downwardly extending free ends 8 of plate-like body 7 serve to contain the compression regions 15 and 16 at least against lateral dissipation by preventing displacement of sand.

15 For anchoring of larger vessels or anchoring in adverse conditions where greater anchoring power is required, two anchor members may be connected at spaced intervals in the direction of applied tension so that the more remote anchor can provide greater resistance to rotational forces applied to the other anchor and which might otherwise rotate the anchor sufficiently to allow it to be dislodged by anchor rope tension.

20 Although the sand anchors have been described herein with reference to beachside anchoring of pleasurecraft and the like, it will be readily apparent to a skilled addressee that anchors according to the invention may be employed for a variety of purposes in sandy soil conditions.

25 Other applications for the anchor may include anchoring of light aircraft, helicopters and the like or the provision of anchoring to enable winching of motor vehicles bogged in sandy soils.